

REMARKS

By the present amendment, dependent claim 5 has been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. In particular, dependent claim 5 has been amended to be in independent form by incorporating subject matter from claims 3 and 4. Entry of these amendments is respectfully requested.

In the Office Action, claim 5 was rejected under 35 USC §102(b) as being anticipated, or in the alternative, under 35 USC §103(a) as being unpatentable over, the '863 Japanese patent cited in the International Search Report. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Before discussing the rejection in detail, a brief review of the presently claimed invention may be quite instructive. As defined by amended claim 5, the subject sintered body of aluminum titanate is obtained by the process as recited in claim 4 from a raw material composition having a molar ratio of Si in the alkali feldspar to Mg in the Mg-containing component in the range of Si:Mg = 0.9:1 to 1.1:1 as is recited in claim 3. With the use of a raw material composition that meets the above requirements, a sintered body of aluminum titanate is produced which has a greatly improved mechanical strength, improved resistance to thermal decomposition and high refractoriness without losing the

low thermal expansion inherent in aluminum titanate. It is submitted that such a sintered body of aluminum titanate is not taught or suggested by the cited '863 Japanese patent.

To clarify the specific teachings of the cited '863 Japanese patent, a complete English translation thereof is attached hereto. Specifically, the '863 Japanese patent relates to a high strength and low thermal-expansion ceramic obtained by adding sumecton to aluminum titanate, and discloses that MgO, SiO₂ or the like can be added as an additive other than sumecton. However, this patent does not teach or suggest an appropriate range for the amount of sumecton and other additives to be added as it merely shows examples of specific compositions in the Examples.

As is clear from Fig. 4 of the '863 patent, samples Nos. 1 and 2 were prepared using a raw material composition comprising 90 wt% of aluminum titanate, 5 wt% of TiO₂ and 5 wt% of clay, while samples Nos. 3 and 4 were prepared using a raw material composition comprising 90 wt% of aluminum titanate, 5 wt% of TiO₂ and 5 wt% of sumecton SA. The clay composition is shown in Fig. 1, which indicates that it contains 49.3 wt% of SiO₂ and 0.2 wt% of MgO. The composition of sumecton SA is shown in Fig. 3, which indicates that it contains 53 wt% of SiO₂ and 30 wt% of MgO. The Si/Mg molar ratio of the raw material composition of samples Nos. 1 and 2 and that of the raw material composition of samples Nos. 3 and 4 are calculated to be 165.38 and 1.18, respectively, based on the above compositions.

Thus, the '863 patent discloses a Si/Mg molar ratio of the raw material composition of samples Nos. 1 and 2 to be 165.38 and that of samples 3 and 4 to be 1.18. In addition, the patent does not disclose any specific compositions of raw material compositions other than these specific examples. In distinct contrast, as discussed above, the Si:Mg molar ratio of the raw material composition used for preparing the subject sintered body of aluminum titanate according to amended claim 5 is to be in the range of 0.9:1 to 1.1:1. This range is distinctly different from the Si:Mg molar ratio of the raw material compositions used in the preparation of the sintered bodies of aluminum titanate according to the '863 Japanese patent.

As disclosed in the subject specification at page 3, lines 1 to 11, the raw material composition used for the preparation of the sintered body of aluminum titanate according to the presently claimed invention comprises alkali feldspar represented by a specific chemical formula and a Mg-containing oxide. The sintered body of aluminum titanate prepared using such a raw material composition has greatly improved mechanical strength, improved resistance to thermal decomposition and high refractoryness while maintaining the low thermal expansion inherent in aluminum titanate. In addition, the subject specification discloses on page 7, lines 3 to 7 that a preferable Si:Mg molar ratio of the raw material composition for the above-described properties is in the range of Si:Mg = about 0.9:1 to about 1.1:1.

As set forth above, the '863 Japanese patent merely discloses specific examples of the Si/Mg molar ratios of the raw material composition as 165.38 and 1.18. The patent does not teach or suggest that a sintered body of aluminum titanate with the excellent properties as described above can be obtained when the Si:Mg molar ratio of the raw material composition is in the range of 0.9:1 to 1.1:1.

It is submitted that above range for the Si:Mg molar ratio of the raw material composition is significant. In support thereof, attention is directed to the attached Declaration of Mr. Tsutomu Fukuda, one of the inventors of the subject application. The Declaration presents evidence that the use of a raw material composition whose Si:Mg molar ratio is in the range of 0.9:1 to 1.1:1 provides a sintered body of aluminum titanate with high mechanical strength and resistance to thermal decomposition.

More specifically, the Declaration sets forth physical properties for sintered bodies of aluminum titanate prepared with the use of a raw material composition whose Si:Mg molar ratio is in the range of 0.9:1 to 1.1:1 in accordance with the present invention, as well as for sintered bodies prepared with the use of raw material compositions whose Si:Mg molar ratios are not within this range. Particularly, the Declaration shows test results for three-point bending strength, resistance to thermal decomposition and coefficient of thermal expansion for the following three sintered bodies:

(1) a sintered body prepared using a raw material composition whose Si:Mg molar ratio is 1.06:1 in the same manner as in Example 1 of the present application;

(2) a sintered body of sample No. 3 in the '863 Japanese patent, whose Si:Mg molar ratio is 1.18:1; and

(3) a sintered body whose Si:Mg molar ratio is set to 0.84:1 by changing the amount of additive (s) of the sintered body of sample No. 3 above.

The test results set forth in the Declaration demonstrate that the sintered body (1) prepared using the raw material composition whose Si:Mg molar ratio is 1.06:1 has an extremely high strength and excellent resistance to thermal decomposition as compared with sintered bodies (2) and (3) prepared using the raw material composition whose Si:Mg molar ratio is lower than 0.9:1 or higher than 1.1:1.

In summary, the '863 Japanese patent merely discloses, as specific examples, the compositions of samples Nos. 1 and 2 whose Si:Mg molar ratio is 165.38:1 and samples Nos. 3 and 4 whose Si:Mg molar ratio of 1.18:1, and nowhere discloses a sintered body of aluminum titanate prepared using a raw material composition whose Si:Mg molar ratio is in the range of 0.9:1 to 1.1:1 as is presently claimed. Accordingly, it is submitted that the sintered body of aluminum titanate as defined in amended claim 5 in terms of the composition of the raw material composition distinguishes over the sintered bodies of aluminum titanate according to the '863 Japanese patent. In addition, the '863 Japanese

patent does not teach or suggest that a sintered body having high strength and resistance to thermal decomposition can be obtained using a raw material composition whose Si:Mg molar ratio is in the range of 0.9:1 to 1.1:1. Therefore, it is submitted that amended claim 5 is unobvious over the '863 Japanese patent.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 102(b) and § 103(a) and allowance of claim 5 over the cited Japanese patent are respectfully requested.

Claims 1-5 were rejected under 35 USC § 103(a) as being unpatentable over the U.S. patent publication 2003/0015829 to Fukuda et al in view of either of the patents to Kameda or Oda et al. Reconsideration of this rejection in view of the following comments is respectfully requested.

With regard to this rejection, it is to be noted that the publication to Fukuda et al is assigned to the same assignee as the subject application and that the subject application has an effective filing date prior to the publication date of the Fukuda et al publication. In particular, the publication to Fukuda apparently has a filing date of November 6, 2001, and a publication date of July 23, 2003. The subject application has a PCT filing date of April 16, 2003, prior to the publication date.

A recent amendment to 35 USC § 103(c) became effective as to any application filed after November 29, 1999. This amendment provides that prior art effective under the provisions of 35 USC § 102(e), that is, a U.S. patent having a issue date subsequent to the filing date of the subject application, or a published U.S. patent application having an earlier filing date, is no longer effective prior art if the two have the same assignee. Since the Fukuda et al publication and the subject application are assigned to the same assignee and the basis for citation of the patent would be 35 USC § 102(e) for the Fukuda et al publication, the above provisions of § 103(c) would apply. Thus, the cited Fukuda et al publication has been removed as an effective reference and the rejection has been obviated.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 1-5 over the cited publications are respectfully requested.

Claims 1-5 were rejected under 35 USC § 103(a) as being unpatentable over the '659 Japanese patent publication in view of either of the patents to Kameda or Oda et al. Reconsideration of this rejection in view of the following comments and attached translation of the priority document is respectfully requested.

It is to be noted that the '659 publication apparently has a publication date of May 22, 2002. The subject application claims priority from a Japanese patent application having a filing date of April 26, 2002, prior to the publication date of the cited patent publication.

To perfect the claim for priority, submitted herewith is a verified English translation of the Japanese priority application (Japanese Patent Application No. 2002-126553). Since the claim for priority to the prior Japanese patent application is perfected by submission of the verified English translation of the Japanese priority application and since this application provides adequate support for the subject matter claimed, the cited '659 publication has been removed as an effective reference and the rejection has been obviated.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 1-5 over the cited publications are respectfully requested.

Claims 1-5 were provisionally rejected over claims 1-3 of copending application Ser. No. 10/169,728 in view of either of the above patents to Kameda or Oda et al, based on the judicially created doctrine of obviousness type double patenting. In addition, claims 1-5 were provisionally rejected over claims 1-5 of copending application Ser. No. 10/530,476 on the same basis. In making these rejections, it was asserted that, although the

claims of this application and the cited copending applications are not identical, they are obvious over the other and thus are not patentably distinct. Reconsideration of these rejections in view of the attached Terminal Disclaimers and the following comments is respectfully requested.

Accompanying this Amendment are two Terminal Disclaimers signed by a representative of the assignee such that the patent which issues from this application is enforceable for the same period of time as the patents issuing from the cited applications and thus there is no extension of protection for the common concept. Accordingly, withdrawal of the provisional double patenting rejections is requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit

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Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Declaration; Verified Translation of JP 2002-126553; Translation of H04-280863; Terminal Disclaimers (2)